

AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning line 5, page 1, with the following amended paragraph:

--The present invention relates to a light-emitting diode device and method of manufacturing the same, and more particularly to the light emitting diode (LED) device ~~includes~~ including a light-transmission conductive layer with high transparency and a patterned transparent conductive layers. ~~Further, the~~ The LED device of present invention ~~has~~ includes the light-transmission conductive layer with high transparency and [[a]] the patterned transparent conductive layers so as to improve ~~the~~ transmission efficiency, ohmic conductivity and light brightness.--

Please replace the paragraph beginning line 14, page 1, with the following amended paragraph:

--The conventional light emitting diode (LED) device, especially InGaN LED device, has the problem of light intensity degradation. As shown in Figure I a, the conventional InGaN LED element has an n-type GaN layer 21, an InGaN active layer 22, a transparent conductive layer 24, and a p-type GaN layer 230 which are stacked sequentially in layers on the top face of a sapphire substrate [[30]] 10. The substrate 10 of conventional light emitting diode device is

formed on the bottom of light emitting diode device. The semiconductor layer 20 has an n-type semiconductor layer 21, an active layer 22 and a p-type semiconductor layer 23, wherein the active layer 22 grown between the n-type semiconductor layer 21 and the p-type semiconductor layer 23, an n-pad 210 on the n-type semiconductor layer and at least a p-pad 230 on the p-type semiconductor layer 23; a transparent conductive layer 24 is formed above the p-type semiconductor layer 23.--

Please replace the section entitled BRIEF DESCRIPTION OF THE DRAWINGS beginning line 18, page 3, and bridging page 4, with the following amended section:

--Figure 1a illustrates a simplified schematic diagram of a conventional light emitting diode device;

Figure 1b illustrates top view of conventional light emitting diode device;

Figure 2a illustrates a simplified schematic diagram of the present invention of light emitting diode device;

Figure 2b illustrates a top view of the present invention of a light emitting diode device;

Figure 3a illustrates ~~one of~~ a first embodiment of the patterned transparent conductive layer of a light emitting diode device [[ef]] according to the present invention;

Figure 3b illustrates ~~one of~~ a second embodiment of the patterned transparent conductive layer of light emitting diode device [[ef]] according to the present invention;

Figure 3c illustrates ~~one of~~ a third embodiment of the patterned transparent conductive layer of light emitting diode device [[ef]] according to the present invention;

Figure 4 illustrates the relationship between [[a]] the transparency of the patterned transparent conductive ~~layers~~ layer divided to transparency of light-transmission conductive layer and patterned transparent conductive layers area in present invention; and

Figure 5 illustrates a simplified schematic diagram of another embodiment of the light emitting diode device of the present invention.--

Please replace the paragraph beginning line 18, page 4, with the following amended paragraph:

--The present invention ~~provides~~ is directed to a light emitting diode device having a light-transmission conductive layer with high transparency and a patterned transparent conductive layer for increasing light brightness. Referring to Fig. 2a, the LED of present invention, for example an InGaN LED device, ~~comprising~~ comprises a sapphire substrate 10 on the bottom of the light emitting diode device;

a semiconductor layer 30 ~~[[is]]~~ formed above the substrate 10 including an n-type semiconductor 31, an active layer 32 and a p-type semiconductor layers 33, wherein the active layer 32 is formed between the n-type semiconductor layer 32 and p-type semiconductor layer 33; a patterned transparent conductive layer 40 ~~[[is]]~~ formed on the p-type semiconductor layers 33 and filled with a light-transmission conductive layer 50 so as to increase transmission effectively of the high brightness light emitting diode device; wherein the n-type semiconductor 31 is an N-GaN layer, the p-type semiconductor layer 33 is a P-GaN layer, the active layer 32 is an InGaN/GaN multiple quantum well structure, and the patterned transparent layer 40 is a metal-oxide which is made with at least one ~~of metals~~ metal including Ni, Au, Cr, Ir, Pt, Ag, Ru and Be etc. composed with oxide. The light-transmission layer 50 with high transparency is an oxide layer selected from ~~the~~ a group consisting of indium tin oxide (ITO), indium oxide, tin oxide, zinc oxide, and magnesium oxide. Further, the present invention ~~provides a~~ is also directed to the method of manufacturing the high brightness LED device ~~more particularly~~ ~~to~~ having the light emitting diode device with a light-transmission conductive layer with high transparency and a patterned transparent conductive layer ~~manufactured method.~~

Please replace the paragraph beginning line 18, page 5, with the following amended paragraph:

--In accordance with the present invention to manufacture the LED device, for example, manufacturing an InGaN LED device to high brightness is the embodiment of present invention. The InGaN LED device was grown on a C-plane ~~sapphire~~ sapphire substrate 10, ~~[[the]]~~ made from pure  $\text{Al}_2\text{O}_3$  material. The thickness of the ~~sapphire~~ sapphire substrate is about 300  $\mu\text{m}$ . Next, ~~[[a]]~~ the semiconductor ~~layers~~ layer 30 ~~[[was]]~~ is formed on the substrate 10 by MOCVD. Above the semiconductor layer 30, Si ions are implemented in the n-type GaN layer to a 3.5  $\mu\text{m}$  thickness, an active layer 32 is formed with multiple quantum well of InGaN/GaN and then Mg ions are ~~implemented~~ implanted in a p-type GaN. After forming the ~~layers of above description~~ described layers, parts of p-type GaN are etched to expose the n-type GaN as an n-GaN layer 31. Forming a p-type and an n-type ohmic contact layers, there are a plural of layers formed above the semiconductor layers. An n-type ohmic contact layer is formed with reactive ion etching technique. Part of semiconductor layers is removed till n-GaN layer. Ti and Al is deposited as n-type contact layer and an n-pad 210. Hereinafter, a transparent conductive layers are made of NiO

and Au; then using Ti and Al ions deposited on to form a p-type ohmic contact layer and a p-pad 230.--

Please replace the paragraph beginning line 12, page 6, with the following amended paragraph:

--In order to ~~increasing~~ increase brightness, the TCL of the LED device with low transparency need to be replaced, so the present invention provides a light-transmission conductive layer with ITO, indium-tin-oxide, materials to increase the transparency of the LED device. On the other hand, the ITO of the conductive layer ~~made the produces a~~ LED device with low ohm property. So the present invention of TCL of LED device is divided ~~[[tø]]~~ into a plural of region and arranged in matrix-lines called a patterned transparent conductive layer 40. On the patterned transparent conductive layer, a light-transmission conductive layer 50 is overlaid.--

Please replace the paragraph beginning line 20, page 6, with the following amended paragraph:

--Referring to figure 2b showing the top view of embodiment of present invention, the LED device includes a light-transmission conductive layer 50 and a patterned transparent conductive layer 40. The light-transmission conductive layer 50 with high transparency overlays the

patterned transparent conductive layer 40. ~~In figure Figs.~~  
3a, 3b, 3c ~~shows the shape~~ show three different shapes of the  
patterned transparent conductive layer ~~[[is]]~~, i.e. a net-  
shaped, a spot-shaped, or ~~[[any]]~~ other ~~successive~~ shape with  
hollow-~~[[out]]~~ cuts. The hollow out in each of the  
embodiments is filled by the light-transmission conductive  
layer 50 which is an oxide layer selected from the group  
consisting of indium tin oxide (ITO), indium oxide, tin oxide,  
indium lead oxide, lead oxide, antimony tin oxide, antimony  
oxide, antimony zinc oxide, cadmium tin oxide, cadmium oxide,  
zinc oxide, and magnesium oxide ~~in present invention~~.--

Please replace the paragraph beginning line 19, page  
7, with the following amended paragraph:

--~~Further, in the above embodiment~~ In the above  
embodiments, the high brightness LED device includes a  
patterned transparent conductive layer 40 and a light-  
transmission conductive layer 50. The method of manufacturing  
the LED device comprising comprises: forming a substrate 10 on  
the bottom of the high brightness light emitting diode device;  
forming a semiconductor layer 30 above the substrate 10  
~~includes an~~ including a n-type semiconductor, an active layer  
and a p-type semiconductor ~~layers~~ layer, wherein the active  
layer is formed between the n-type semiconductor layer and p-

type semiconductor layer; forming a patterned transparent conductive layer 40—formed on the p-type semiconductor—layers layer, and forming a high transparency conductive layer 50 ~~formed to~~ overlay the matrix-lines transparent conductive layer.--

Please replace the paragraph beginning line 18, page 8, with the following amended paragraph:

--Referring to figure 5, a simplified schematic diagram of another embodiment of light emitting diode device of the present invention, the embodiment of high brightness of the LED device of the present invention comprising: a sapphire substrate 10 on the bottom of the light emitting diode device; a semiconductor layer 30 is formed above the sapphire substrate 10 includes an n-type semiconductor 31 is made of a GaN compound to an n-type GaN layer, an active layer 32 and a p-type semiconductor layer 33 is made of the GaN compound to a p-type GaN layer, wherein the active layer 32 is formed between the n-GaN layer 31 and the p-GaN layer 33; a patterned reflection layer 41 is formed on the p-GaN layers 33; a patterned transparent conductive layer ~~[[42]]~~ 40 is formed on a patterned reflection layer 41; and a light-transmission conductive layer 50 is formed to overlay ~~[[a]]~~ the hybrid of the patterned transparent conductive layer 40 and the



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patterned reflection layer 41; wherein the patterned reflection layer 41 reflects light which is absorbed by the patterned transparent conductive layer 40 so as to increase illumination of the light emitting diode device.--